

Due to the increased carbon conversion achieved with this design, it will be possible to eliminate the soot recovery and soot recycle system that is normally employed downstream of the gasifier. Thus electrical heating of the throat area will reduce the gasification plant capital cost. The concept of electrical heating of the refractory can be extended to the entire gasifier hot face. If the entire hot face of the gasifier (not just the throat area) is electrically heated, it will be possible to preheat and cure the gasifier refractories electrically. There will be no need for using a preheat burner, a flue gas cooler and an aspirator (steam ejector) for preheating refractories. This will reduce the gasification plant capital cost further.

IN THE DRAWINGS:

Applicant respectfully submits for the Examiner's approval the proposed drawing amendments as shown on the two drawing sheets appended hereto. The two drawing sheets show the proposed changes to Figures 2 and 3 in red. In Figure 2, L₁ is replaced by L₃. In Figure 3, D₃ is replaced by D₄. The proposed changes are simply changes to reference numerals, and therefore do not add new subject matter.

IN THE CLAIMS:

Please cancel claims 11-14 and 21, amend claims 10 and 15-19 by replacement with the rewritten claims 10 and 15-19 below, and add claims 30-36 below. A marked-up version of the amended and new claims, showing the changes made by underlining of the added text and bracketing of the deleted text, is appended hereto.

10. (Amended) A quench gasifier for gasifying ash-containing hydrocarbon feedstocks, comprising:

a combustion chamber for partially oxidizing carbon in the feedstocks to produce synthesis gases; and

a quench chamber adjacent to said combustion chamber, said combustion chamber including a throat adjacent to said quench chamber for directing said gases from said combustion chamber to said quench chamber, characterized in that said throat includes:

an inlet adjacent to said combustion chamber, said inlet having an inlet diameter;

B8 an outlet adjacent to said quench chamber, said outlet having an outlet diameter;

an inner surface and outer surface between said inlet and said outlet;

an electrical heating element between said inner and outer surfaces; and

wherein said inlet diameter is greater than said outlet diameter.

✓ 15. (Amended) The quench gasifier according to claim 10 wherein said inner surface comprises a wind tunnel profile.

B9 16. (Amended) The quench gasifier according to claim 10 wherein said throat further comprises a layer of insulating refractory material between said electrical heating element and said outer surface.

17. (Amended) The quench gasifier according to claim 10 wherein the ratio of said inlet diameter to said outlet diameter is at least 3.

18. (Amended) The quench gasifier according to claim 17 wherein said ratio is in the range from 3 to 7.

B9 19. (Amended) The quench gasifier according to claim 10 wherein said quench chamber comprises a quench ring substantially axially adjacent to said throat outlet, such that the quench gasifier does not include a plenum chamber.

✓ 30. (New) The quench gasifier according to claim 17 wherein said inlet diameter gradually and continuously decreases to said outlet diameter along said inner surface.

31. (New) The quench gasifier according to claim 10 wherein said heating element extends from said outlet to said inlet.

B10 32. (New) The quench gasifier according to claim 31 wherein said heating element is a spirally wound member having a first diameter near said throat inlet and a second diameter near said throat outlet, and wherein said first diameter is greater than said second diameter.

33. (New) The quench gasifier according to claim 10 wherein said heating element extends from said outlet to above said inlet such that said heating element extends into a portion of said combustion chamber.

34. (New) A quench gasifier for gasifying hydrocarbon feedstocks, comprising:

a combustion chamber for partially oxidizing the carbon in the feedstocks to produce synthesis gases and slag;

a quench chamber adjacent to said combustion chamber, said quench chamber having a gas outlet for directing said gases away from said quench chamber; and

wherein said combustion chamber includes a throat for directing said gases and said slag from said combustion chamber to said quench chamber, said throat comprising:

an inlet;

an outlet;

an outer surface between said inlet and said outlet;

an inner surface between said inlet and said outlet;

a heating element between said inner and outer surfaces; and

wherein said inner surface has a curved, conical contour.

35. (New) The quench gasifier according to claim 34 wherein said heating element is near said inner surface such that said heating element substantially follows said curved, conical contour of said inner surface.

36. (New) The quench gasifier according to claim 34 wherein said throat inlet is adjacent to said combustion chamber, and said heating element extends beyond said inlet into a portion of said combustion chamber.
